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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,079	09/12/2003	Michael W. Morrow	ITL.1028US (P16764)	7093
21906	7590	09/13/2007	EXAMINER	
TROP PRUNER & HU, PC			PAN, DANIEL H	
1616 S. VOSS ROAD, SUITE 750				
HOUSTON, TX 77057-2631				
			ART UNIT	PAPER NUMBER
			2183	
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			09/13/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/661,079	Applicant(s) MORROW, MICHAEL W.	
	Examiner Daniel Pan	Art Unit 2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,6,30 and 32 is/are pending in the application.
- 4a) Of the above claim(s) 17-24 and 26-29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,30 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>01/06/04</u> . | 6) <input type="checkbox"/> Other: _____ |

1. Claims 1,3,5,6,30,32 remain for examination. Claims 17-24 and 26-29 have been canceled. The T.D. on 06/02/06 has been received.
2. Applicant's election without traverse of Group I (claims 1,3,5,6,30,32) in the reply filed on 07/10/07 is acknowledged.
3. Applicant's arguments with respect to claims 1, 3,5,6,30,32 have been considered but are moot in view of the new ground(s) of rejection. However, response to applicant remarks will be included below for clarifying the teaching of prior art.
4. Applicant remarks :
 - a) Borkenhagen did not teach that an instruction is applied to a lookup table that includes entries corresponding to predetermined conditions.
 - b) Borkenhagen did not teach or suggest executing at least one additional instruction present in a pipeline and storing a result thereof instead of flushing the instruction while preparing to switch to a second thread.
5. As to a) above, Borkenhagen clearly taught feedback from caches and lookup table was routed to sequencers 350 and then communicated to thread control unit 400 which resulted in a thread switch (see col.9, lines 13-24). Therefore, instruction must be applied to the caches and lookup table for thread switch.
6. As to b), see obviousness discussions Chaudhry

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2183

invention was made to a person having ordinary skill in the art to which said subject matter pertains.
Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1,3,5,6,30,32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Borkenhagen et al. (6,076,157) in view of Chaudhry (2003/0018826).

8. As to claims 1, Borkenhagen taught (see fig.6) :

a) determining whether execution of an instruction of a first thread may require a long latency (see the first execution attempt of the instruction of thread T0 in 620) based on a lookaside table [cache][lookup table] that included entries corresponding to predetermined conditions (see the virtual to real address mapping, see the control register bit assignment in co1.13, lines 29-67, col.4, lines 1-21, see cache misses and lookup table misses in col.9, lines 35-52, see also the comparison of threshold value with the counter co1.16, lines 11,-37.

9. These entries in the lookaside table were addresses for read and write purpose. A unsuccessful lookup into the table would lead to latency in reading. Therefore, Borkenhagen's lookaside table did determine a potential latency.)

b) preparing to switch to a second thread based on selection of program counter of the second thread to fetch a next thread (see the switching to a second thread [T1] the instruction may require the long latency , see the switch to a second thread T1 upon no completion of the first instruction in 630, co1.16, lines 44-47, see the fetch unit for fetch requests in co1.8, lines 50-63).

10. No instruction decoder explicitly shown, but Borkenhagen taught instruction unit 220

(See the instruction unit 220). Therefore, Borkenhagen must have a decoder, or the like to decode the instructions from the instruction unit 210. No specific type of instruction

decoder has been reflected into the claim. Therefore, it is read as an instruction decoder in general. Examiner also holds that instruction decoder in general had been known in the art.

11. Borkenhagen did not specifically show the executing of at least one additional instruction in the first thread while preparing to switch to his second thread as claimed. However, Chaudhry taught a system allowing continuing execution of a current thread while switching to another thread (see Paragraph [0012]). One of ordinary skill in the art should be able to recognize a thread is a group of instructions or processes. It would have been obvious to one of ordinary skill in the art to use Chaudhry in Borkenhagen for executing an additional instruction while switching a second thread as claimed because the use of Chaudhry could provide Borkenhagen the ability to maintain the processing of the pending thread before the actual thread switch occurred, thereby conserving the result of last process being already run (e.g. no flushing or resetting), and therefore reducing the time wasted on the switching, and because Borkenhagen also taught an evaluation of the threshold of the thread, no switch would occur if no instruction could be executed (see co1.16, lines 18- 25), which was a suggestion of the need for continuing the execution of the instructions in the current thread while switching the second thread in order to minimize the latency on the result of the switching, and for doing so, provide a motivation.

12. As to claims 3, Borkenhagen also included a stochastic analysis (see cache miss in co1.15, lines 43-61) of whether the instruction will result a long latency.

13. As to claim 5, Borkenhagen also taught feedback to the fetch unit (see fetch requests for fetch in co1.8, lines 50-63).

14. As to claim 6, 32, Borkenhagen taught maximum number of waiting cycles could be customized according to specific hardware configuration and software code,

and was loaded to a time-out register, and could reach to zero (see col.15, lines 10-42). Therefore, Borkenhagen was also applicable for less than 10 cycles. As to the to pipeline stage delay, examiner holds that one of ordinary skill in the art should be able to recognize the customized number of waiting cycles in Borkenhagen was applicable to any number of delay including 2 pipeline stage delay unless applicant can show the two pipeline stage delay is unique from the customized number of waiting cycles.

15. As to claim 30, see different type of instructions for VLIW and superscalar in col.3, lines 20-33. See also the thread state bits 4:7 for indicating the load instruction or store instruction in col.10, lines 42-43. The load instruction is one type and the store instruction is another type of instruction.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

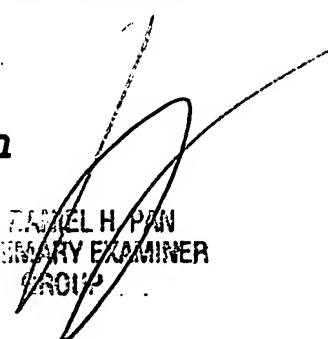
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dan Pan whose telephone number is 571 272 4172.

The examiner can normally be reached on M-F from 8:30 AM to 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chan, can be reached on 571 272 4162. The fax phone number for the organization where this application or proceeding is assigned is 703 306 5404.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

21 Century Strategic Plan


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